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man at the lever draws down the end a little with one hand, and with the other, placed on the handle of *c*, depresses that end, and therefore raises the other, and with it the loose link *e*: this latter raises the click *b* out of its notch, and allows the man to put the lever in the dotted position, in which it is disengaged from the scale-beam, and the weights are free to act.

No. X.

INSTRUMENTS FOR EXTRACTING TEETH.

The SILVER MEDAL was presented to Mr. J. GRAY, 25 Old Burlington Street, for his improved Instruments for extracting Teeth; a complete Set of which has been placed in the Society's Repository.

SIR, London, 30th October, 1838,
25 Old Burlington Street.

HAVING been too late for the season, in my application of 1837, I now beg to lay my improved instruments for the extraction of teeth and stumps before the Society for the Encouragement of Arts, &c.

These instruments are, with the greatest deference, submitted to the Society of Arts, and to the medical profession generally; and should they be found to possess any merit, or be the means of suggesting improvement in the painful operation of extracting teeth, I am quite aware that the Society and the medical world will fully appreciate the slightest advance, nor consider the smallest

improvement as trifling or insignificant, when the object aimed at is the abatement of human suffering.

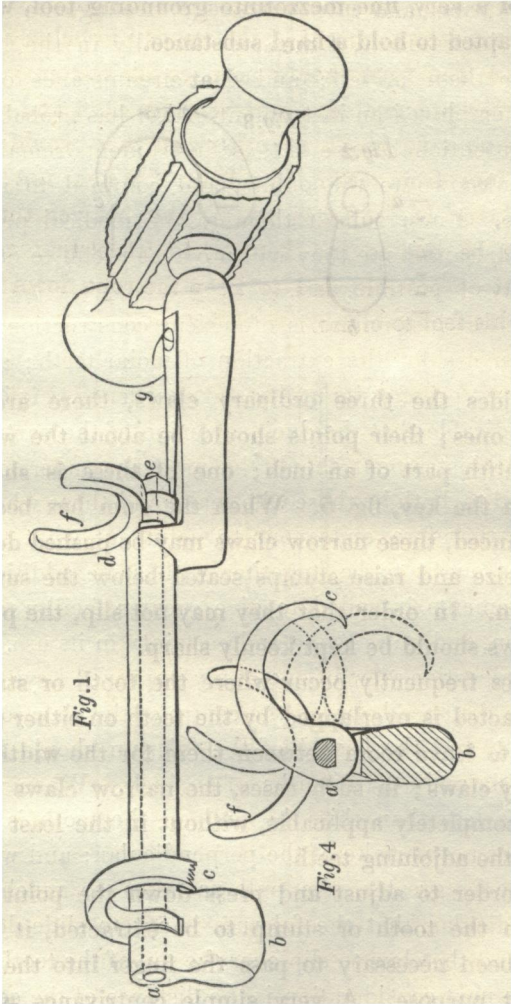
Upwards of twenty years ago, feeling the want of certain instruments, I was occasionally in the habit of making them myself; and the circumstance of never having employed an instrument-maker has probably been the unintentional cause of these instruments remaining so long unknown to the public, and confined to my own practice. I now submit them to the medical profession generally, and hope they will prove as useful to others as they have been to myself.

The key instrument is of ancient construction, and in common use for the extraction of molar teeth; and this is the best proof of its utility and excellence. It is, therefore, desirable that the due proportion of the parts of this valuable instrument should be properly understood and attended to, both by those who make and those who use it. I shall, therefore, endeavour to point out what the proportions ought to be, together with some additions and improvements intended to give greater facility to its application, and more scope and certainty in its use. Fig. 1 is a perspective view of one of my improved keys.

The distance between the centre of the claw joint-hole *a*, fig. 2, and the base *b* of the fulcrum should be from six to six-and-a-half tenths of an inch. When the distance is less than this, the pull on the tooth is lateral, and does not partake of the perpendicular; and when the distance is greater, the pull partakes so much of the perpendicular, that the fulcrum is apt to slide down the gum, and the claw to slip over the top of the tooth.

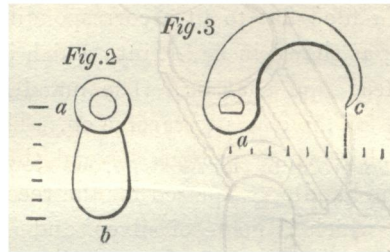
The next consideration is the distance of the centres of the joint-holes of the claws from their points, fig. 3. The three claws should measure six, seven, and eight-

tenths of an inch respectively, in a straight line from the centres of the joint-holes *a* to their points *c*. The claws



should not terminate in three points, as if intended to act on a soft substance, but should terminate in two lateral

points, or in a concave, as at *c*, fig. 1, of which the teeth or notches should be fine and close together, like the teeth of a very fine mezzotinto grounding tool, which is best adapted to hold a hard substance.



Besides the three ordinary claws, there are three narrow ones; their points should be about the width of the twelfth part of an inch; one of these is shewn in place in the key, fig. 5. When the gum has been properly lanced, these narrow claws may be pushed down, so as to seize and raise stumps seated below the surface of the gum. In order that they may not slip, the points of the claws should be kept keenly sharp.

Cases frequently occur where the tooth or stump to be extracted is overlapped by the teeth on either side, so as not to leave room between them for the width of the ordinary claws; in such cases, the narrow claws will be found completely applicable, without in the least endangering the adjoining teeth.

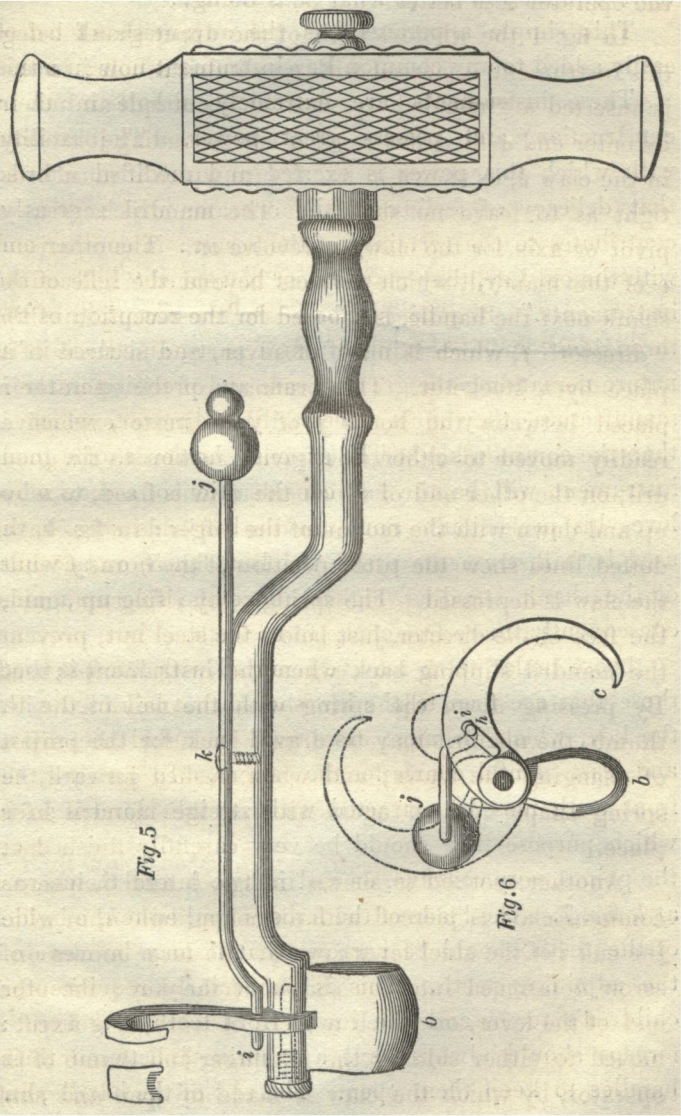
In order to adjust and press down the point of the claw on the tooth or stump to be extracted, it has hitherto been necessary to pass the finger into the mouth for that purpose. A very simple contrivance which I added to my own key instrument, many years ago, completely obviates the necessity of putting the fingers into

the mouth at all ; and thus, the light not being obstructed, the operator sees better what he is doing.

In fig. 1 the whole length of the upper shank ad of this instrument is pierced with a cylindrical hole ; in this is inserted a "mandril" ae , having about half an inch of its outer end a filed flat to fit a corresponding joint-hole in the claw c , as shewn in fig. 4, into which it must fit so tight as to leave no shaking. The mandril acts as a pivot or axis for the claws to revolve on. The other end e of the mandril, which projects beyond the hole of the shank next the handle, is squared for the reception of the "director" f , which is made of silver, and secured in its place by a steel nut. The forefinger of the operator is placed between the horns f of the director, which is readily moved to either side, giving motion to the mandril, on the other end of which the claw is fixed, to move up and down with the motion of the finger : in fig. 4, the dotted lines shew the tilted position of the horns f whilst the claw is depressed. The spring g , by rising up against the face of the director, just below the steel nut, prevents the mandril slipping back when the instrument is used. By pressing down the spring with the nail of the left thumb, the mandril may be drawn back for the purpose of changing the claws ; and when pushed forward, the spring snaps up and again secures the mandril in its place.

Another method is shewn in figs. 5 and 6, where a common claw is pierced with an oblong hole h , in which the end i of the steel lever ij acts ; the lever moves on a screw k fastened into the shank of the key ; the other end of the lever, on which a piece of ivory, j , is fixed, is moved to either side by the forefinger and thumb of the operator, by which the claw is made to open and shut,

like the blades of forceps ; and, when adjusted, may be



made to press so hard as to prevent its slipping off the tooth or stump in the process of extraction.

This simple apparatus has the advantage of being easily added to any common key-instrument now in use.

These instruments are extremely simple in their construction, and possess great power. The facility with which this power is exerted and modified affords that delicacy of feeling to the operator which greatly contributes to the certainty of the result : in comparison with the old key, they may almost be termed "self-acting instruments." Requiring to be of the finest workmanship throughout, and consisting of extra parts, and these of a nature demanding the greatest care and precision in their manufacture, they must necessarily be more expensive than the common key. The expense, however, of a good instrument will be the last consideration of a man who loves his profession. Some medical friends who have used both instruments prefer the last, fig. 5, on account of the shank standing higher above the fulcrum, and, consequently, more free of the front teeth.

Loose molar teeth may be removed with forceps ; but those that are firm in the jaw should first be raised with the key, which, in most cases, will be found the safest and least painful course for the patient. In general, the front teeth may be extracted with straight forceps ; for which purpose they should be very carefully finished at the points, very concave, or end in two lateral points, as at *l*, fig. 7. The blade of the forceps applied to the inside of the teeth should be narrow, that it may be clear of the adjoining teeth. This is particularly requisite for children's teeth, and the lower front teeth in general : forceps should always have a "spring" between their handles to keep them open. The end of the handle, on

the same side with the narrow blade, should be turned outwards, as at *m*, in the form of a semicircle or hook, for the outside of the little finger to rest in. This gives

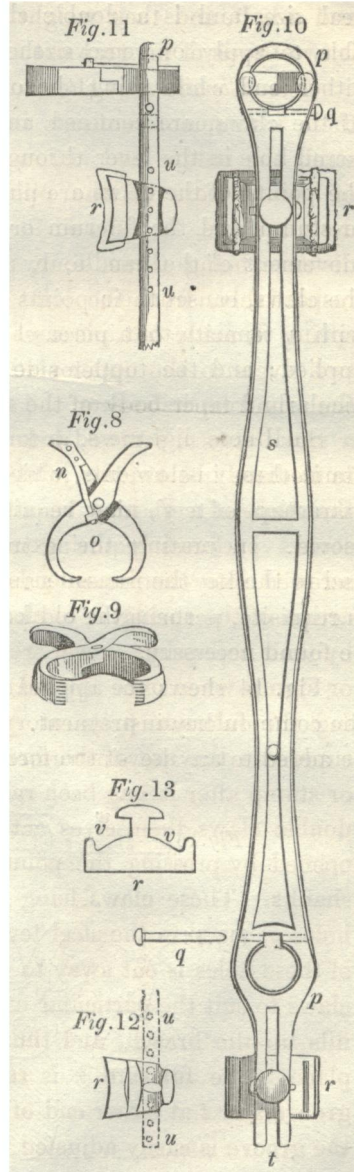


the operator great purchase in a straight pull, without over-compressing the handles. The distance from the centre of the joint-holes to the points of these forceps should be about an inch, their extreme length six inches

and a-half, and their weight about nine ounces. Fig. 7 is two-thirds of the real size.

The Elevators.—The fundamental improvement in these instruments consists in double claws of tempered steel, the nature and action of which is similar to that of the nippers in the pile-driving machine. These double claws, figs. 8 and 9, are of different lengths, the distance being three, four, and five-eighths of an inch respectively, from the joint to their points. A small spring *n*, made of a piece of clock-spring, is fastened by two rivets to the upper side of one of the claw shanks: the round taper body of the spring acts through a hole in a small stud *o*, screwed into the other limb of the claws immediately below the joint-hole; or a small spring, of the shape of a V, may be attached to the claws by two screws perforating the extremities of the spring, and screwed into the inner ends of the claw shanks. The action of the spring is to close the claws. Spring-claws, by their collapsing power, retain their hold of the tooth or stump when once applied, and afford facility in adjusting the fulcrum preparatory to extraction: they also supersede the use of the forceps for removing the tooth or stump after it has been raised from its socket, for the double claws themselves act as forceps. The claws are opened by pressing the point of the finger between their shanks. These claws hang loosely in one of the round holes *p*, made in the steel lever, figs. 10 and 11. A part of these holes is cut away to give facility in changing the claws to suit the particular case: the pin *q* being inserted fills up the breach, and thus secures the claws in their place. The fulcrum *r* is readily slid in or out of the groove *s* or *t* at either end of the lever, and by moving in the groove is easily adjusted to the case. The fulcrum or

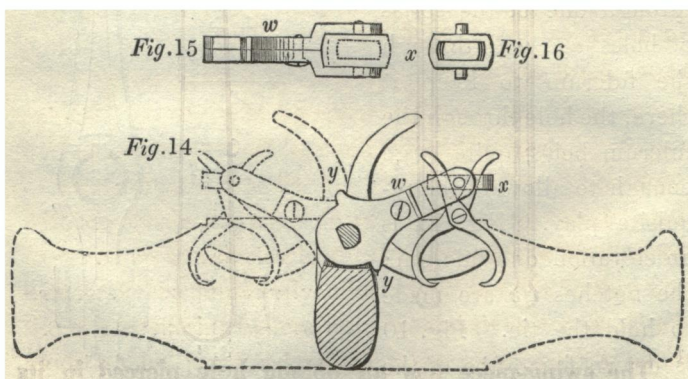
rest is made of ivory, and its face is hollowed, as shewn at *r*, fig. 12, for the purpose of tying on a piece of leather, cork, India-rubber, or wood, as the case may require, to protect the gum or top of a tooth from injurious pressure. The difference of the two ends of the lever is obvious: at the end *t* the fulcrum is always beyond the claws, but when placed in the groove *s* it is always within the claws. The back of the fulcrum is rounded, as shewn in figs. 11 and 12, to let the lever roll on it; and when adjusted to the required place, a small pin is passed through one of the series of holes *uu*, and through the fulcrum to keep it there, the hole through the fulcrum being quite large enough to allow of the requisite play. Fig. 13 is an elevation of a fulcrum: the notches *vv* are made to hold the tie. Fig. 10 is drawn four-fifths of the



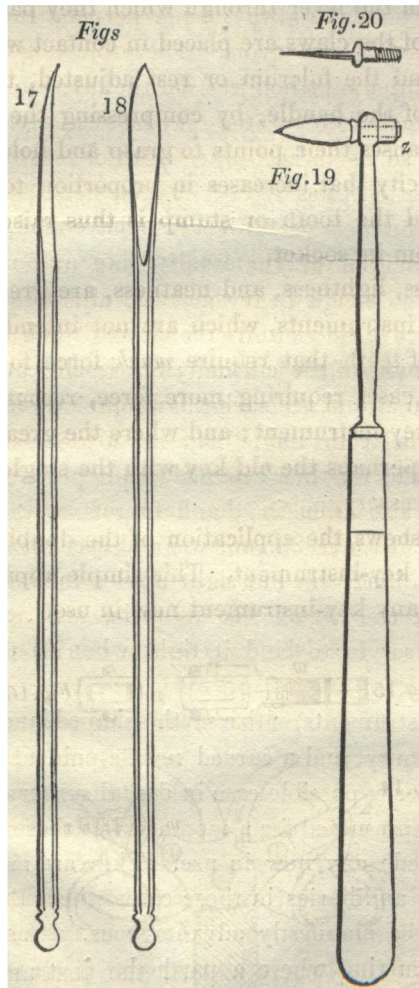
real size, and is a double elevator, the operator being able to apply or remove the fulcrum and claws from either end while using the other. The shanks, or tails of the claws, are confined and pressed together by the round hole in the lever through which they pass. When the points of the claws are placed in contact with a tooth or stump, and the fulcrum or rest adjusted, the upward movement of the handle, by compressing the shanks of the claws, causes their points to grasp and hold the tooth with a tenacity that increases in proportion to the force applied; and the tooth or stump is thus raised perpendicularly from its socket.

Smallness, lightness, and neatness, are great desiderata in these instruments, which are not intended for the extraction of teeth that require *much* force for their removal. In cases requiring more force, recourse may be had to the key-instrument; and where the greatest power is requisite, perhaps the old key with the single claw will be found necessary.

Fig. 14 shews the application of the double claws to the common key-instrument. This simple apparatus may be added to any key-instrument now in use.



The suspending arm w is in halves, as shewn in fig. 15, held together by a screw. A piece of steel x , shewn separate in fig. 16, swings in the halves of the suspending arm by two pivots.



The swing-piece has an oblong hole pierced in its

centre, which receives and compresses the shanks of the claws, in the same manner that the round holes do in the elevator, the joint-screw of the claws being taken out to place the separate halves in the swing-piece and then re-inserted. The claws always hang perpendicularly in the piece, as it swings on pivots. The projecting parts *yy* at each side of the joint-hole rest on the fulcrum of the key, and the attached apparatus may be swung to either side of the key, so as to act either right or left-handed, as is shewn by dotted lines.

One of the most useful lancets I have made is concave internally and convex externally, like a long and very narrow spoon, as shewn in figs. 17 and 18.

The concave side admits the convexity of the tooth, so that the action of the cutting edge is close to the fang, and between it and the socket, without injuring the gum. Many painful teeth and stumps require no other instrument than this for their removal.

I have also been in the habit of using an angular lancet, figs. 19 and 20, narrow and spear-pointed, about half an inch long, fixed at right angles in a steel holder, in which it can revolve, so as to be used at any angle. The nut *z* serves to bind it tight when in the required position.

These instruments, with a scythe-shaped lancet or sharp-pointed bistoury, and a curved needle-pointed tenaculum, will meet every possible case in dental surgery.

It is not presumed for a moment that these instruments will supersede any now in use. They are meant merely to serve as auxiliaries in those cases where their employment may be manifestly advantageous. Cases are continually occurring where a particular instrument is, and ought to be, preferred, without regard to its ancient or

modern construction, provided it be best adapted to the purpose.

Much severe suffering is often occasioned at intervals for years by decayed stumps, supposed (at least by the patient) to be incapable of extraction, although palpably loose in their sockets. These tender stumps are apt to break and crumble in the forceps; and when the key-instrument is applied, they yield on one side to the pressure of the claw, which consequently slips off, and baffles the operator.

In such cases the double claws will be successful, with great ease both to the patient and surgeon, for they grasp the stump with a keenness and lightness of which the forceps is incapable; and as their construction prevents their pressure from ever exceeding that which is just necessary for extraction, so there is no risk of breaking the stump, which being grasped on both sides, cannot slip out of the claws, while the force employed in the operation is rendered comparatively trifling by the instrument acting perpendicularly.

In many cases of tender stumps, the finger or the cedar-wood pencil, rested on the top of the teeth, will be found the most convenient fulciment when using the elevator; or a piece of leather may be wrapped round the instrument, to rest on a tooth. The support of the finger, or a pencil applied under the shank of the key-instrument, will often be found serviceable.

The double claws, whether in the elevator or attached to the key, will be found very useful, especially for the removal of tender stumps. Where the common key-instrument is inapplicable, from absorption of the alveolar process, or from its being in a state of inflammation, not admitting the opposite pressure of the fulcrum in its

usual situation, the elevator may be advantageously substituted. Hollow teeth, extremely liable to break by the common key-instrument, from the oblique pressure of the claw being applied only on one side, are not exposed to the same accident in the double claws, where the pressure is equally divided on both sides of the tooth, and the action is perpendicular.

These instruments have been seen, and highly approved of, by Drs. Hume, Kerrison, Seymour, Davison, Severn, &c.; and surgeons Keate, Liston, Carpue, Elwyn, Nicolson, Brown, Kingdon, Tod, &c. &c.; and by the London Medical Society.

I am, Sir, &c. &c.

A. AIKIN, *Esq.*
Secretary, &c. &c.

JOHN GRAY.

This paper was accompanied by written testimonials from the above-named gentlemen.

No. XI.

CUPPING GLASS.

The Thanks of the Society were voted to J. L. FENNER, Esq. for the following Communication, describing a very simple and effectual Method of applying the Cupping-Glass.

15 King's Row, Pentonville,
 March 6, 1839.

SIR,

I BEG to submit to the Society of Arts my invention to render the operation of cupping (whether with the scari-